

## **CLAIMS:**

We Claim:

1. An arrangement for obtaining information about objects in an environment around a vehicle, comprising:

5 light emitting means arranged on the vehicle for emitting infrared light into the environment around the vehicle;

receiver means arranged on the vehicle for receiving infrared light from the environment around the vehicle; and

10 measurement means coupled to said light emitting means and said receiver means for measuring time between emission of the infrared light by said light emitting means and reception of the infrared light by said receiver means whereby the measured time correlates to distance between the vehicle and an object from which the infrared light is reflected.

15 2. The arrangement of claim 1, wherein said light emitting means comprise an array of laser diodes.

3. The arrangement of claim 1, wherein said light emitting means comprise a pulsed laser.

20 4. The arrangement of claim 1, wherein said light emitting means comprise a continuous laser beam directing infrared light to scan in a line and means for controlling said scanning laser beam of infrared light such that the infrared light traverses a volume of space near the vehicle.

25 5. The arrangement of claim 4, wherein said receiver means comprise a single pixel receptor.

6. The arrangement of claim 1, wherein said receiver means comprise at least one of a CCD array, a CMOS array and an HDRC camera, a dynamic pixel camera and an active pixel camera.

30 7. The arrangement of claim 1, further comprising a processor coupled to said receiver means for providing an identification of the object from which light is reflected.

8. The arrangement of claim 7, wherein said processor utilizes pattern recognition techniques.

9. The arrangement of claim 7, wherein said processor utilizes a modular neural network to identify the object from which light is reflected.

10. The arrangement of claim 7, wherein said processor is arranged to create a three-dimensional map of a portion of the environment surrounding the vehicle.

11. The arrangement of claim 10, wherein said processor is arranged to extract features from the three-dimensional map.

12. The arrangement of claim 11, further comprising a display visible to a driver of the vehicle for displaying features or representations derived from features extracted from the three-dimensional map.

13. The arrangement of claim 1, wherein said light emitting means and said receiver means are collocated.

14. The arrangement of claim 1, wherein said light emitting means comprise a plurality of light emitting elements and said receiver means comprise at least one light receiving element.

15. The arrangement of claim 14, wherein said associated light emitting elements and said at least one receiving element are spaced apart from one another.

16. The arrangement of claim 1, wherein said receiver means comprise a notch filter for filtering light other than infrared light emitted by said light emitting means.

17. The arrangement of claim 1, wherein said receiver means comprise a light valve.

18. The arrangement of claim 1, further comprising a processor coupled to said measurement means for determining distance between the vehicle and the object from which infrared light is reflected and velocity of the object based on a plurality of position measurements.

19. A system for controlling a vehicular system based on the presence of an object in an environment around a vehicle, comprising:

an arrangement for obtaining information about the object, said arrangement comprising

light emitting means arranged on the vehicle for emitting infrared light into the environment around the vehicle, and

receiver means arranged on the vehicle for receiving infrared light from the environment around the vehicle;

5 a vehicular system adapted to be controlled or adjusted upon the determination of the presence of an object in the environment around the vehicle; and

a processor coupled to said arrangement and said vehicular system for obtaining information about the object based at least on the infrared light received by said receiver means and controlling the vehicular system based on the obtained information.

10 20. The system of claim 19, wherein said processor is arranged to measure time between emission of the infrared light by said light emitting means and reception of the infrared light by said receiver means whereby the measured time correlates to distance between the vehicle and the object from which the infrared light is reflected.

15 21. The system of claim 19, wherein said receiver means are arranged to obtain at least one image of the environment around the vehicle, said processor being arranged to process said at least one image and identify any objects in said at least one image.

20 22. The system of claim 21, wherein said processor utilizes pattern recognition techniques.

23. The system of claim 22, wherein said processor utilizes a modular neural network to identify any objects in said at least one image.

25 24. The system of claim 19, wherein said receiver means comprise at least one of a CCD array, a CMOS array and an HDRC camera, a dynamic pixel camera and an active pixel camera.

30 25. The system of claim 19, wherein said processor is arranged to create a three-dimensional map of a portion of the environment surrounding the vehicle based on the infrared light received by said receiver means.

26. The system of claim 25, wherein said processor is arranged to extract features from the three-dimensional map.

27. The system of claim 26, wherein said vehicular system is a display visible to a driver of the vehicle for displaying features or representations derived from features extracted from the three-dimensional map.

5 28. The system of claim 19, wherein said vehicular system is a steering wheel having an adjustable turning resistance.

29. The system of claim 19, wherein said vehicular system is at least one of an audio alarm and a visual warning viewable by a driver of the vehicle.

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